ASTRONOMY 101.001 (Call # 14178)

INTRODUCTION TO ASTRONOMY

Fall 2009

Instructor: Prof. Richard Rand

Class Time: Tuesdays and Thursdays 9:30 – 10:45

Location: 103 Regener Hall

Office Hours: Thursdays 12 - 1 in my office (see below).
Or just send email

Phone: 7-2073

email: rjr@phys.unm.edu

Office: Room 166, Physics and Astronomy Bldg.
(corner of Lomas and Yale)

Home page: www.phys.unm.edu/~rjr/rjrhome.html

Text: Astronomy: A Beginner's Guide to the Universe, by Chaisson and McMillan, 6th ed. (required)

Astronomy is the oldest of the sciences and also one of the most fascinating to people in general. This is a time of great discoveries about the universe which we all hear about in the press on a seemingly regular basis. One of the goals of this course is for you to become informed enough about the cosmos to understand how these discoveries have been made and what they really mean. Astronomy also satisfies people's natural curiosity to find out about this place that we find ourselves in -- the universe. The fruits of astronomical research are not solely the property of professional astronomers, but of everyone, and by the end of this class, you'll be in a good position to partake.

We have a big task in front of us this semester: a tour of the universe. There's no prerequisite for this class, besides an open mind and desire to know what is out there. You will learn some physics and see a small amount of math.

In the lectures, we will occasionally watch a video, and you'll see some of the latest results from the Hubble Space Telescope, various Mars missions, and more. We'll also use iClickers and online homework (see below). Please also explore the website that accompanies the book, through Mastering Astronomy (see below). It contains a hyperlinked version of the book (unfortunately not available until Oct 23), interactive figures, tutorials, animations and videos.

If you don't understand something, please ask! Chances are, many people around you don't understand it either. Or come to office hours or send an email if you prefer. And come to office hours if you want to chat about any astronomy-related topic, like something you saw on TV or read about, or perhaps you are thinking about becoming a physics or astrophysics major or entering an astronomy-related profession. Also, check out astronomy material on the Web. There is a vast amount of it. Some good links are on my homepage.

COURSE GROUND RULES

General. There is not time to do justice to every topic in the book, or in astronomy in general, especially in the lectures. However, you are generally responsible for all chapter sections listed in the Schedule below, whether I lecture on it or not. There are a couple of exceptions to this rule. First, the book has more equations than the lectures will. You are only responsible for equations you see in lecture. Second, you are only responsible for the More Precisely boxes, some of which have a lot of math, if I lecture on them in class. It will benefit you greatly to read the relevant chapter or sections before I discuss them in class, including the supplementary material on the book's website. The lectures are used to reinforce the reading and to explain the more important concepts in some detail.

Webpage. My home page (see URL above) will have electronic versions of all handouts (syllabus, test reviews, etc.) and occasionally other material.

Grading. There will be four tests, each worth 20% of the grade, all multiple choice, about 35-40 questions each. There will be weekly online homework assignments that add to 20% of the grade (see below). Each test will cover only material since the last test (or, for the first test, since the beginning of the course). The tests are graded on a curve. The last test will be held at the scheduled final exam time for this class, which is Tuesday, Dec 15 at 7:30-9:30am. Note this test is NOT a final, however. Test questions will be based on both the lectures and text. There should be CAPS tutors for this class.

Regarding grade disputes; if you feel your test grade is in error, please bring it to my attention no later than 2 weeks after receiving your graded test.

Make-up tests. You may make up a test only if you have a valid excuse AND YOU NOTIFY ME BEFORE THE TEST. You MUST make up the test within ONE WEEK of the original test date. All make-ups will include an oral test. These take place IN MY OFFICE, not in Regener. You cannot be more than 15 MINUTES LATE for a makeup.

Online homework – MasteringAstronomy. There will be nearly-weekly online homework assignments using MasteringAstronomy. Your book should have come with an access code for the website www.masteringastronomy.com which will allow you to register and create an account. If you don't have an access code, you can go to this website, click on "New Students" and choose "No, I need to purchase access online now". To "enroll" in the online homework, you need the

course ID, which is ASTR101F09RAND. For your "Login Name" enter your nine-digit UNM Banner ID number (ignore the recommendation to use your email address). THIS IS CRUCIAL!!! YOU WILL ALSO CHECK YOUR TEST GRADES AND COURSE GRADE ON THIS WEBSITE AND THE ID MUST MATCH THE BANNER ID YOU WRITE ON THE TESTS FOR THIS TO WORK!!! Don't put in your name or email for "Login Name". For "Student ID" enter your Banner ID again.

Each assignment should take an hour or somewhat less. Many questions include hints (for which there is a small bonus for not revealing) and feedback on incorrect answers. You can view the grading policy at the website. The presentation and grading policy for the assignments and questions is included as a link from my homepage – this includes penalties for late assignments, penalties for entering incorrect answers, bonuses for not revealing hints, etc. There are 11 assignments in all. Each carries a different number of points. Each has a due date and time, but you can take as long as you want before that time. There is a 30% penalty for every day the assignment is submitted late. You can go back and review any assignment for practice throughout the semester. The first assignment is a generic introduction that will not be graded, but will greatly help you understand how everything works. Do this assignment first. The next one is due Sept 7 at 10 pm. They will generally be due Mondays at 10 pm, but check the site for the exact due dates. You can rework any assignment for practice until the end of the semester. Any students who do not appear to be true participants in the online assignments will be suspended from the website.

Let's face it: you probably won't like MasteringAstronomy at first – only 20% do in the first few weeks. But this rises to 90% by the last weeks. And student test grades typically rise 5-7% as a result of doing the online homework.

iClickers. To help you review for the tests, and to give you the (only) chance to earn some extra credit, we will use iClickers. Starting Tuesday in the second week, at some point in each lecture we will do three or four clicker questions that review the previous one or two lectures. You can get the extra credit just by participating: if you try to answer, right or wrong, >85% of the questions throughout the semester, I will boost your final grade one notch: i.e. a C+ becomes a B-.

Register your iClicker at http://www.iclicker.com/registration. FOR "STUDENT ID" ON THAT SITE, ENTER YOUR BANNER ID. DO THIS EVEN IF YOU'VE ALREADY REGISTERED IT FOR ANOTHER CLASS. THIS IS IMPORTANT! YOU MAY NOT GET THE EXTRA CREDIT IF YOU DON'T DO THIS! You can also retrieve your remote ID on that webpage if it has become illegible.

Cell phones, Ipods, blackberries, etc.: keep them turned off and out of sight in class or preferably don't bring them to class at all. If a phone rings, I will stop lecturing and stare in the direction of the ringing until the problem goes away. Such devices cannot be used or visible during tests.

SCHEDULE

DATE	TOPIC	READING
Aug 25	Introduction	
27	The Sky, Foundations of Astronomy	Chap. 0
Sep 1	The Sky, Foundations of Astronomy cont.	Chap. 0
3	From Aristotle to Newton	Chap. 1
8	Radiation and the Electromagnetic Spectrum	Chap. 2
10	Atoms and Spectroscopy	Chap. 2
15	Telescopes	Chap. 3
17	Test #1	
22	Intro. to the Solar System Solar System Formation	Chap. 4.1, 4.3
24	The Earth	Chap. 5, skip 5.7
29	The Moon, Mercury, Venus	Chap. 5, 6
Oct 1	Mars	Chap. 6
6	The Jovian Planets	Chap 7, skip magnetospheres in 7.6
8	Moons, Rings, Pluto and Solar System Debris	Chap. 8, 4.2
13	Test #2	
15	Fall Break	
20	The Sun	Chap. 9
22	Measuring the Stars	Chap. 10
27	Material Between the Stars: The Interstellar Medium Star Formation	Chap. 11
29	Stellar Evolution	Chap. 12.1-12.3, 12.6

Nov 3	Stellar Death: Stellar Explosions Neutron Stars	Chap. 12.4,12.5 Chap. 13.1-13.3
5	Black Holes	Chap. 13.5-13.8
10	Black Holes video	
12	Test #3	
17	The Milky Way Galaxy	Chap. 14
19	Galaxies	Chap. 15
24	Galaxies (cont.)	Chap. 16
26	Thanksgiving	
Dec 1	Cosmology: The Big Bang and the Evolution of the Universe	Chap. 17
3	Cosmology (cont.)	Chap. 17
8	Video - The Accelerating Universe	
10	Video - The Hunt for Alien Worlds	Chap. 18, 4.4
15	Test #4, 7:30 am, 103 Regener	

MASTERING ASTRONOMY ASSIGNMENT DUE DATES
(generally due Mondays at 10pm unless otherwise indicated)

Introduction to Mastering Astronomy (not graded)	Mon Sept 7
Foundations, from Greeks to Newton	Mon Sept 7
Radiation, Atoms, Spectroscopy	Mon Sept 14
Telescopes (a short assignment)	Wed Sept 16, 5pm (note special date and time)
Intro to Solar System, Earth	Mon Sept 28
Moon, Mercury, Venus, Mars	Mon Oct 5
Jovian Planets, Moons, Rings, Pluto, Debris	Mon Oct 12
The Sun, Measuring the Stars	Mon Oct 26
Interstellar Medium, Star Formation, Stellar Evolution	Mon Nov 2
Massive Star Death, Neutron Stars, Black Holes	Mon Nov 9
Milky Way, Other Galaxies, Galaxy Evolution, Dark Matter	Mon Nov 30
Cosmology, Early Universe, Life in the Universe	Mon Dec 7